Wood Manufacturing Technology

Program of Studies
2014-2015

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Office of Career and Technical Education
Kentucky Department of Education

WOOD MANUFACTURING TECHNOLOGY

Program Area Course Title	Post-Secondary Connection	Valid Course Code	Recommended Grade Level							Recommended Credit
Wood Manufacturing Course List										
			6	7	8	9	10	11	12	
Advanced Wood Processing	WMT 290	480733					X	X	X	1
Cabinet Making Technology	WMT 240	480731					X	X	X	1
CAD for Wood Technology		480725				X	X	X	X	.5
CAD 1 Intro to Computer Aided Drafting	CAD 100	480110				X	X	X	X	1
Cooperative Education I (Wood)	WMT 199	480741						X	X	1
Cooperative Education II (Wood)	WMT 299	480742						X	X	2
Cooperative Education III (Wood)	WMT 198 & WMT 298	480743						X	X	3
Furniture Technology	WMT 250	480721					X	X	X	1
Internship (Wood)	WMT 198	480744					X	X	X	1-3
Introduction to Panel Processing	WMT 230	480711					X	X	X	1
Lumber Grading and Drying	WMT 215	480716					X	X	X	1
Millwork Technology	WMT 260	480717					X	X	X	1
Special Problems	IEX 293	480725						X	X	1
Technical Drawing and Blueprint Reading	WMT 110	480719				X	X	X	X	.5
Wood Finishing	WMT 160	480720				X	X	X	X	.5
Wood Product Manufacturing	WMT 120	480740				X	X	X	X	1

CO-OP:

A student may repeat co-op or internship for more than one credit, to the maximum number of credits allowed by the high school.

ELECTIVES:

The courses listed as electives are not part of certification requirements. Elective courses may be an addition to any certification but not a replacement or substitute for any required course.

Wood Manufacturing Technology

Overview of Wood Manufacturing Technology

Purpose:

The Wood Manufacturing Technology Program is designed to enhance the student's future by providing them with broad range of specialized skills. Student's mastering the technical knowledge and skills required can be industry certified through Woodworking Career Alliance.

The Wood Manufacturing Technology Program prepares students by engaging them with science, mathematical, and critical thinking skills through the classroom and lab/shop training.

Wood Manufacturing Technology Education will:

- Operate as the center for nationally recognized industry standard training.
- Provide a critical link in school to employment or postsecondary education.
- Develop stronger relationships with the community in terms of mutual advocacy, cooperative field experiences, employment placement, and support for relevant student organizations and competitions
- Represent an important component in the education of all students.
- Require and promote critical thinking and problem solving.
- Offer an up to date curriculum based on standards that adapts to changes in the industry.
- Integrate academic skills into the Wood Manufacturing Technology Curriculum in order to insure that students develop written & verbal communications skills, computational skills, and scientific/math problem-solving skills.
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Career Pathways:

- **Cabinet Maker Helper**
- **Furniture Maker Helper**
- **Automated Wood Processing**
- **Millworker**
- **Wood CNC Operator/Programmer**

Standard Based Curriculum

The Wood Manufacturing Curriculum is composed of standards based competencies. All Wood Manufacturing programs incorporate industry and common core standards thus increasing the student's qualifications toward successful employment.

Alignment of the Wood Manufacturing curriculum with nationally recognized industry standards and the common core standards provides optimal preparation for students to acquire an industry certification.

Communities understand that this preparation provides better career opportunities for students and the demands of today's workforce for the 21st century

Kentucky Occupational Skill Standards

The Kentucky Occupational Skill Standards are the performance specifications that identify the knowledge, skills, and abilities an individual needs to succeed in the workplace. Identifying the necessary skills is critical to preparing students for entry into employment or postsecondary education. These standards described the necessary occupational, academic, and employability skills needed to enter the workforce or post- secondary education in specific career areas. There is an ongoing effort to continue to refine these standards by which exemplary Manufacturing Education Programs are evaluated and certified. This helps insure that curriculum meets industry specifications.

Work Based Learning
Cooperative experience, internships, shadowing and mentoring opportunities provide depth and breadth of learning in the instructional program and allow students to apply the concepts learned in the classroom. The Work Base Learning Guide is available on the KDE webpage: www.education.ky.gov.

Student Organizations and Competitions
Participation in Skills USA Competition provides a vehicle for students to employ higher order thinking skills, to interact with high-level industry people and to further enhance their leadership skill through their participation in regional, state and national competitive events and local activities.

KDE/OCTE Career Pathways Wood Technology 2014-2015		
Career Pathway	**Core Courses**	**Elective Courses**
Automated Wood Processer **CIP Code: 48.0703.01** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **Introduction to Computer Aided Drafting-480110** • **Wood Product Manufacturing-480740** • **Introduction to Panel Processing-480711** • **Plus (1) Elective**	• **Advanced Wood Processing-480733** • **CAD for Wood Technology-480725** • **Internship (Wood) -480744** • **Introduction to Computer Aided Drafting-480110** • **Furniture Technology-480721** • **Lumber Grading and Drying-480716** • **Technical Drawing and Blueprint Reading-480719** • **Cooperative Education I (Wood)-480741** • **Cooperative Education II (Wood)-480742** • **Cooperative Education III (Wood)-480743** • **Special Problems-48095**
Cabinetmaker **CIP Code: 48.0703.02** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **Cabinet Making Technology-480731** • **Technical Drawing and Blueprint Reading-480719** • **Wood Finishing-480720** • **Wood Product Manufacturing-480740**	• **Advanced Wood Processing-480733** • **CAD for Wood Technology-480725** • **Internship (Wood) -480744** • **Lumber Grading and Drying-480716** • **Introduction to Computer Aided Drafting-480110** • **Cooperative Education I (Wood)-480741** • **Cooperative Education II (Wood)-480742** • **Cooperative Education III (Wood)-480743** • **Special Problems-48095**
Furniture Maker **CIP Code: 48.0703.03** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **Furniture Technology-480721** • **Technical Drawing and Blueprint Reading-480719** • **Wood Finishing-480720** • **Wood Product Manufacturing-480740**	• **CAD for Wood Technology-480725** • **Internship (Wood) -480744** • **Lumber Grading and Drying-480716** • **Introduction to Computer Aided Drafting-480110** • **Advanced Wood Processing-480733** • **Cooperative Education I (Wood)-480741** • **Cooperative Education II (Wood)-480742** • **Cooperative Education III (Wood)-480743** • **Special Problems-480795**

Millworker **CIP Code: 48.0703.04** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **Introduction to Computer Aided Drafting-480110** • **Lumber Grading and Drying-480716** • **Millwork Technology-480717** • **Technical Drawing and Blueprint Reading-480719**	• **CAD for Wood Technology-4807??** • **Advanced Wood processing-480733** • **Internship (Wood) -480744** • **Wood Product Manufacturing-480740** • **Cooperative Education I (Wood)-480741** • **Cooperative Education II (Wood)-480742** • **Cooperative Education III (Wood)-480743** • **Special Problems-480795**
Wood CNC Operator /Programmer **CIP Code: 48.0703.05** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **Advanced Wood Processing-480733** • **Technical Drawing and Blueprint Reading-480719** • **WMT 120 Wood Product Manufacturing-480740** • **Introduction to Computer Aided Drafting-480110**	• **CAD for Wood Technology-480725** • **Furniture Technology-480721** • **Internship (Wood) -480744** • **Lumber Grading and Drying-480716** • **Cooperative Education I (Wood)-480741** • **Cooperative Education II (Wood)-480742** • **Cooperative Education III (Wood)-480743** • **Special Problems-480795**
Wood Technology-TRACK **CIP Code: 48.0703.99** *Tests for Certification* • ***WCA Certification*** • ***Kentucky TRACK Pre-Apprenticeship Certification*** • ***KOSSA-Manufacturing Test***	• **(4)- Core courses** • **Chosen from WMT valid course list.** • **By Company sponsoring State Registered Apprenticeship.**	• **(4)- Core courses** • **Chosen from WMT valid course list.** • **By Company sponsoring State Registered Apprenticeship.**

KENTUCKY CAREER PATHWAY/PROGRAM OF STUDY TEMPLATE

COLLEGE/UNIVERSITY: Morehead State University
Kentucky Community and Technical College
HIGH SCHOOL (S): Lincoln County ATC

CLUSTER: Maufacturing
PATHWAY: Wood Technologist/Manufactuirng Manager
PROGRAM: Wood Manufacturing

	GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES CAREER AND TECHNICAL EDUCATION COURSES			CREDENTIAL CERTIFICATE DIPLOMA DEGREE	SAMPLE OCCUPATIONS
SECONDARY	9	English I	Algebra I	Earth Science	Economics	History and Appreciation of Visual and Performing Arts	WMT 120 Wood Product Manufacturing	WMT 110 Tech Draw/ Blueprint Reading		
	10	English II	*See Construction Geometry	Biology	U.S. History	WMT 110 Blueprint Reading	WMT 160 Wood Finishing	WMT 230 Intro to Panel Processing	Wood Career Alliance (Green Credential)	Cabinetmaker Helper Furnituremaker Helper
	11	English III	Algebra II	Physical Science	World Geography	DFT 122 Intro to CAD	WMT 240 Cabinet Making Technology	WMT199 Coop ◆	Wood Career Alliance (Green Credential)	Cabinet Maker Furniture Maker
	12	English IV	4th Math			WMT 290 Advanced Wood Processing	WMT 250 Furniture Technology	WMT199 Coop ◆	TRACK Pre-Apprenticeship / High School Diploma	Wood CNC Operator/Programmer
		Take ACT - Apply for admission to KCTCS							*ONet Certificates	
POSTSECONDARY	Year 13	Writing	Math	Science	Computer Applications	EFM 100 Personal Financial Management	ISX 100 Industrial Safety	WMT 260 Millwork Technology		
	Year 14	Communications	Math	Humanities	Social Interaction	WMT 280 Estimating	WPP 200 Workplace Principles	CAD 200 Intermediate CAD	Wood Technologist Diploma	Wood Technologist
		Apply for admission to Morehead State University								
	Year 15	Communications	Humanities	Psychology	Economics	IET 330 Industrial Design	IET 319 Quality Control	IET 327 Applied Industrial Management		
	Year 16	Arts and Humanities	Math	Science	[illegible] Material Properties and Testing	IET 317 Time and Motion Study	IET 300 Technology and Society	IET 320 Supervisory Practices	Bachelor's Degree	Manufacturing Manager

Required Courses
Recommended Elective Courses
Other Elective Courses
Career and Technical Education Courses
Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2)
(◆=High School to Comm. College) (● =Com. College to 4-Yr Institution) (■ = Opportunity to test out)
Mandatory Assessments, Advising, and Additional Preparation

Note: Categories of courses (e.g. Required, Recommended Electives, other Electives and career and Technical Education) apply to both secondary and postsecondary levels.

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Wood Manufacturing Technology Courses/Tasks

Advanced Wood Processing
480733

Course Description:
This course is a capstone experience for advanced wood processing technicians involving the integration of computer aided design and world-class manufacturing of wood products.

Content/ Process

Students Will:

1. Demonstrate and practice safe work habits at all times
2. Identify the basic parts of a CNC machining center
3. Describe the career opportunities and job titles in CNC
4. Identify the tasks that must be done to put a job into production
5. Describe the tasks in the CNC process
6. Identify standard and auxiliary axes on routers and boring machines using the "Right Hand Rule"
7. Describe the characteristics of and differences between position and reference points
8. Calculate coordinate points using absolute Cartesian values
9. Calculate coordinate points suing incremental Cartesian values
10. Locate and select coordinate values for reference points
11. Identify data storage media in CNC
12. Identify the components of a CNC system
13. List the special features of CNC
14. Select the tooling for a CNC job
15. Select and use appropriate holding tools
16. Perform routine maintenance
17. Load code into the control of CNC machining center
18. Align and coordinate the machine and tools
19. Enter tool offsets and cutter geometry
20. Test and run a program
21. Write and operator setup document
22. Select speeds and feeds for the type of tool and material to be machined
23. Plan an efficient and safe program with good sequencing
24. Identify proprietary differences in "G" and "M" codes
25. Use the basic coded words in the program

Connections:

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Cabinet Making Technology
480731

Course Description:
This course is an overview of the cabinet and store fixture industries. Emphasis will be placed on the design and construction of face frame as well as frameless (32mm) systems. Students will plan and build a vanity, kitchen cabinet, or shop project which utilizes contemporary casework techniques.

Prerequisites: Technical Drawing and B-print Reading-480719
Wood Product Manufacturing - 480740

Content/ Process

Students Will:

1. Demonstrate and practice safe work habits at all times.
    a. Produce working drawings for a typical set of kitchen cabinets, both manually and with the aid of computer software
2. Produce a cutting list needed to build a set of cabinets
3. Demonstrate an understanding of both face and frame and 32mm systems of cabinet construction
4. Identify standardized cabinet dimensions
5. Differentiate between custom cabinetry and modular/mass-produced cabinetry
6. Compare the cost of manufacturing components (doors and drawers) vs outsourcing
7. Identify trade associations for the cabinet and store fixture industries and review standards and certification programs
8. Manufacture a countertop using high pressure decorative laminate
9. Fabricate a typical cabinetry project
10. Install a typical base and wall cabinet
11. Solve first-degree algebra equations
12. Apply algebraic knowledge to solve verbal problems and formulas
13. Solve simple plan and solid geometry problems
14. Prepare a surface/product for the finishing process
15. Identify the factors associated with finish quality of a wood product
16. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water based products
17. Demonstrate contemporary application techniques for both oil based and water based products
18. Explain the theory and operation of various coating technologies
19. Disassemble, re-assemble, and adjust a conventional spray gun
20. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates
21. Describe EPA and OSHA regulations as they pertain to the finishing industry
22. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems
23. Perform standardized tests on finished surfaces to determine durability.

Connections:

- Common Core Standards

- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

CAD for Wood Technology
4807??

Course Description:
This course is designed for the fundamental principles and capabilities of CAD, basic drafting conventions and operations that are relative to the Wood Manufacturing Industry.

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Produce line entities using various coordinate techniques.
3. Construct geometric shapes in two-dimensional space.
4. Develop detailed orthographic views as required.
5. Construct cross sections of various designs, with cross-hatching incorporated as desired.
6. Apply dimensions and annotations to drawings.
7. Move, copy, delete, and save drawings or portions of drawings.
8. Explore 3-D drawing techniques.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

CAD1 Intro to Computer Aided Drafting
480110

Course Description:

Uses computer graphic workstation in the application of fundamental principles and capabilities of CAD, basic drafting conventions, and operations. An in-depth study of computer aided drafting commands, terminology, command utilization, and skill development.

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Describe, using correct computer terminology, basic computer functions, uses of computers in society and different types of software.
3. Discuss ethical computing issues, such as copyright, privacy, security, and property.
4. Use graphical user interface.
5. Use computer application programs.
6. Access information sources found on networks such as the Internet and be familiar with Web browsers, search sources, and sources of information related to his or her own field.
7. Demonstrate an awareness of different types of software applications.
8. Produce line entities using various coordinate techniques.
9. Construct geometric shapes in two-dimensional space.
10. Develop detailed orthographic views as required.
11. Construct cross sections of various designs, with cross-hatching incorporated as desired.
12. Apply dimensions and annotations to drawings.
13. Move, copy, delete, and save drawings or portions of drawings.
14. Use CAD to manipulate drawings by means of translation, rotation, scaling, zooming, panning, and windowing.
15. Explore 3-D drawing techniques.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Computer Fundamentals
480712

Course Description:

Students use a microcomputer to develop skills in using the operating system and application software including word processing, database, spreadsheet, and the Internet. Communication skills, terminology, impact on society, technology awareness, and ethical issues are presented. This course is intended for the student with some computer-related experience or training.

Prerequisites: Consent of the Instructor

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Demonstrate knowledge of computer terminology
3. Perform operating system functions and identify the file specifications
4. Demonstrate knowledge of an icon-based environment
5. Use word processing software to compose, edit, save, retrieve, and printed documents
6. Use spreadsheet software to formulate, edit, calculate, save, retrieve, and print spreadsheets
7. Use database software to create, edit, save, retrieve, search, sort, and print database reports
8. Describe multimedia applications based on presentation software
9. Demonstrate knowledge of Internet procedures and protocol
10. Identify network applications
11. Perform routine maintenance

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Cooperative Education I (for Wood)
480741

Course Description:

Cooperative Education provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.

Prerequisites: Consent of the Instructor

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Gain career awareness and the opportunity to test career choice(s)
3. Receive work experience related to career interests
4. Integrate classroom studies with work experience
5. Receive exposure to facilities and equipment unavailable in a classroom setting
6. Increase employability potential
7. Earn funds to help with education expenses

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Cooperative Education II (for Wood)
480742

Course Description:

Cooperative Education provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.

Prerequisites: Consent of the Instructor

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Gain career awareness and the opportunity to test career choice(s)
3. Receive work experience related to career interests
4. Integrate classroom studies with work experience
5. Receive exposure to facilities and equipment unavailable in a classroom setting
6. Increase employability potential
7. Earn funds to help with education expenses

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Cooperative Education III (for Wood)
480743

Course Description:

Cooperative Education provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.

Prerequisites: Consent of the Instructor

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Gain career awareness and the opportunity to test career choice(s)
3. Receive work experience related to career interests
4. Integrate classroom studies with work experience
5. Receive exposure to facilities and equipment unavailable in a classroom setting
6. Increase employability potential
7. Earn funds to help with education expenses

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Furniture Technology
480721

Course Description:
Furniture design principles, structural considerations, joinery, fasteners, veneering, and use of specialized machines for complex operations are the focus of this course. Students will plan and build a piece of furniture which includes at least one drawer, a door and some veneering.

Prerequisites: Technical Drawing and B-print Reading-480719
Wood Product Manufacturing - 480740

Content/ Process

Students Will:

1. Demonstrate and practice safe work habits at all times.
2. Analyze a piece of furniture for "good design" qualities
3. Interpret working drawings and visualize the construction techniques
4. Design a furniture project which allows for expansion and contraction of the wood using solid wood, plywood, veneer, or frame and panel construction techniques
5. Identify, evaluate and specify traditional and contemporary construction techniques
6. Calculate machine rates, set-up times, yields, and other production control elements
7. Set-up and operate industrial woodworking equipment to perform common operations
8. Evaluate a given production problem, formulate a plan of action and execute the plan to a satisfactory conclusion
9. Develop skills related to the efficient operation of a rough mill, machine room and an assembly area
10. Fabricate a piece of furniture which lends itself to specified production techniques
11. Identify equipment capabilities and determine sequencing of operations
12. Solve first-degree algebra equations
13. Apply algebraic knowledge to solve verbal problems and formulas
14. Solve simple plane and solid geometry problems.
15. Prepare a surface/product for the finishing process
16. Identify the factors associated with finish quality of a wood product
17. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water based products
18. Demonstrate contemporary application techniques for both oil based and water based products
19. Explain the theory and operation of various coating technologies
20. Disassemble, re-assemble, and adjust a conventional spray gun
21. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates
22. Describe EPA and OSHA regulations as they pertain to the finishing industry
23. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems
24. Perform standardized tests on finished surfaces to determine durability

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Connections:

- Common Core Standards
- Common Core Technical Standards

- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Internship (Wood)
480744

Course Description:
The Practicum provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum do not receive compensation.

Prerequisite: Consent of the Instructor

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Gain career awareness and the opportunity to test career choice(s)
3. Receive work experience related to career interests
4. Integrate classroom studies with work experience
5. Receive exposure to facilities and equipment unavailable in a classroom setting
6. Increase employability potential

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Introduction to Panel Processing
480711

Course Description:
An overview of the terminology, materials, processing equipment and related software utilized by panel processing manufacturers of residential and commercial case work. Emphasis will be placed on the design and fabrication of frameless cabinetry to the use of panel saws, edge banders, CNC boring equipment, and case clamps.

Prerequisites: None

Content/Process

Students will:

1. Identify commercial and residential applications for panel materials
2. Explain industry trends and panel processing equipment capabilities and techniques
3. Identify, evaluate, and specify joinery and assembly techniques
4. Operate various types of software for designing, cutting, and optimization for efficient use of panel goods
5. Specify quality and quantity of materials required to fabricate frameless case work
6. Properly layout component panels utilizing the 32mm system
7. Set up and operate common panel processing equipment including a panel saw, edge bander, boring machine, and case clamp in a cellular manufacturing environment
8. Generate basic machine codes and programs for running machine centers
9. Fabricate a typical frameless piece of case work
10. Develop and perform routine preventive maintenance on the panel saw, edgebander, boring machine, and the case clamp
11. Develop an understanding of the different tooling requirements while working on various panel products
12. Apply work site and lab safety procedures
13. Apply personal safety rules and procedures
14. Apply fire prevention rules and procedures
15. Apply First aid procedures.
16. Explain how to obtain first aid certification
17. Demonstrate hazardous communication procedures
18. Describe and demonstrate universal precaution procedures
19. Solve first-degree algebra equations
20. Apply algebraic knowledge to solve verbal problems and formulas
21. Solve simple plane and solid geometry problems

Connections

- Common Core Standards
- Common Core Technical Standards
- New Generation Science Standards
- Woodworkers Career Alliance (WCA)
- Post-Secondary Education
- CTSO's-Skills USA
- KOSSA

Lumber Grading and Drying
480716

Course Description:
This course prepares an individual to master the National Hardwood Lumber Association's rules for grading hardwoods and to apply those rules in a production setting. Students will identify species and use a deductive process to grade the lumber and assign it a monetary value. Students will also be introduced to hardwood lumber drying systems. Conventional dry kilns, dehumidification, vacuum, and solar kilns are illustrated. Current theories on drying lumber to minimize defects and increase quality are demonstrated. Computer controls are explained.

Content/ Process

Students Will:

1. Demonstrate and practice safe work habits at all times.
2. Demonstrate safe industrial practices
3. Use First Aid and perform CPR
4. Describe basic lumber economics
5. Identify woods by physical characteristics
6. Describe career opportunities in the wood industry
7. List the job titles in the wood industry
8. Calculate the unit of "board feet"
9. Define cutting, clear-faced cutting, and sound cutting
10. Calculate the percentage of clear wood in the clear-face cutting grades
11. Identify requirements for the standard grade of "Firsts and Seconds"
12. Identify requirements for the standard grade of "FASIF"
13. Identify requirements for the standard grade of "#1 Common"
14. Identify requirements for the standard grade of "#2A Common"
15. Identify requirements for the standard grade of "#2B Common"
16. Identify requirements for the standard grade of "#3A Common"
17. Identify requirements for the standard grade of "#3B Common"
18. Identify requirements for the standard grade of "Selects"
19. Measure using a lumber rule
20. Apply grading practices
21. Apply safety techniques when operating a dry kiln
22. Identify the basic components of a lumber dry kiln
23. Identify types of dry kilns
24. Apply sample selection techniques in preparation for loading
25. Calculate the moisture content of samples/sections
26. Calculate the oven-dried weight of samples
27. Calculate the moisture of a sample
28. Construct a drying schedule for a particular species and thickness
29. Apply a drying schedule in a lab kiln for species and thickness
30. Discuss the economics of equality versus time considerations when drying lumber
31. Apply accelerated drying schedules
32. Maintain drying records and charts.

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Connections:

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Millwork Technology
480717

Course Description:

Design of molding, doors, and door frames; windows; stairs; and mantels are the focus of this course. Emphasis will be placed on construction principles, joinery, and fasteners for millwork assemblies. Students will build one or more millwork items.

Prerequisites: Technical Drawing and B-print Reading-480719
Wood Product Manufacturing - 480740

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Interpret architectural prints and shop drawings
3. Define the three levels utilized in the Architectural Woodworking Institute's Quality Standards
4. Conduct field measurements of projects in process to verify dimensions
5. Identify typical stock and custom millwork projects and products
6. Select a profile, design a template, grind the knives, install the tooling, set-up the molder, run the stock, and troubleshoot the machine
7. Calculate feed rates needed to meet AWI specifications for millwork
8. Fabricate one or more millwork products to a specified quality level
9. Recognize the common sizes, types, and construction techniques used to manufacture doors, windows, and stair parts
10. Prepare a finishing sample which reflects AWI premium grade specifications
11. Prepare a take-off and an estimate from a set of architectural plans
12. Sharpen cutters on an abrasive wheel or stone

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Special Problems (Wood)
4807??

Course Description:

Allows the student to gain intermediate experience in their perspective fields through projects and tasks assigned by the instructor and based on applications the student may one day experience as a professional. Sets the foundation for more in-depth projects that will be included in the student's future portfolio. Focuses on various assignments and curriculum as determined by the program instructor.

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Expand their portfolio of CAD drawings to enhance career opportunities
3. Discuss occupation opportunities

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Technical Drawing and Blueprint Reading
480719

Course Description:

Fundamentals of multiview and pictorial drafting techniques; and reading and interpreting architectural, furniture, and cabinet drawings are the focus of this course. Students will apply blueprint reading skills by preparing materials and cutting lists for actual jobs.

Prerequisites: None

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Develop freehand sketching techniques used to convey object size and shape
3. Use and care for drafting equipment and supplies properly
4. Layout and draw orthographic, sectional, isometric, oblique, and perspective drawings
5. Read and interpret specifications from architectural plans and detail drawings
6. Practice industry standards for dimensioning and notation
7. Master basic geometric construction concepts and techniques
8. Utilize the design process to develop a solution to a problem
9. Prepare a bill of materials for a typical wood product by performing a materials take-off from an architectural drawing
10. Create drawings needed for route sheets, subassembly, and final assembly sheets

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Wood Finishing
480720

Course Description:

This course is an overview of contemporary spray finishing materials and processes for millwork assemblies. Students will learn to set up and troubleshoot a variety of common finishing systems while experimenting with finishing materials and supplies.

Prerequisites: None

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Prepare a surface/product for the finishing process
3. Identify the factors associated with finish quality of a wood product
4. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water based products
5. Demonstrate contemporary application techniques for both oil based and water based products
6. Explain the theory and operation of various coating technologies
7. Disassemble, re-assemble, and adjust a conventional spray gun
8. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates
9. Describe EPA and OSHA regulations as they pertain to the finishing industry
10. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems
11. Perform standardized tests on finished surfaces to determine durability
12. Apply work site and lab safety procedures
13. Apply personal safety rules and procedures
14. Apply fire prevention rules and procedures
15. Apply First aid procedures.
16. Explain how to obtain first aid certification
17. Demonstrate hazardous communication procedures
18. Describe and demonstrate universal precaution procedures

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO's-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards

Course Description:

Fundamentals of wood processing and an overview of the secondary wood processing industry are covered in this course. The nature of wood, material selection, terminology, safe setup, and operation of common woodworking equipment will be discussed. Students will fabricate a wood product while being introduced to custom woodworking techniques, as well as mass production concepts related to product engineering.

Prerequisites: None

Content/Process

Students will:

1. Demonstrate and practice safe work habits at all times.
2. Discuss the characteristics of wood as a building material
3. Specify and order lumber, veneer, plywood, particleboard, fiberboard, laminates, composite materials, hardware, and related materials and supplies
4. Identify common species of hardwoods and softwoods
5. Observe all safety rules and regulations when using hand tools, portable electric tools, and stationary machines
6. Practice safe setup and operation of woodworking equipment
7. Master basic jig and fixture design and development concepts
8. Develop common production planning materials, route sheets, subassembly sheets and final assembly sheets
9. Evaluate and specify appropriate joinery when assembling two or more components
10. Describe the properties of common thermosetting and thermoplastic adhesives and the most appropriate application techniques for each
11. Select and utilize common abrasive materials for surface preparation of the wood
12. Apply work site and lab safety procedures
13. Apply personal safety rules and procedures
14. Apply fire prevention rules and procedures
15. Apply First aid procedures.
16. Explain how to obtain first aid certification
17. Demonstrate hazardous communications procedures
18. Describe and demonstrate universal precaution procedures
19. Set up and solve ratios and proportions
20. Convert between various units of measure
21. Solve problems involving significant digits, and accuracy and precision of measurements
22. Perform mathematical operations with standard and metric measurement systems

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO’s-Skills USA
- KOSSA
- New Generation Science Standards
- Post-Secondary Education
- WCA Industrial Standards